AMENDMENTS TO THE SPECIFICATION

Please amend paragraph [0014] as follows.

[0014]

In addition, a region on a tire circumference at the tire tread portion is divided into a third region including a contact region in contact with the road surface, and a fourth region including other than the third region and by approximating displacement data in the fourth region, a second approximation curve defined in the third and fourth regions is calculated. The background components can thereby be obtained in such a manner that the deformation of the tire cyclically changes with the rotation of the tire. In particular, since the second approximation curve is calculated through approximation of the displacement data in the third and fourth regions by providing a plurality of nodes in the fourth region, and since the second approximation curve is calculated by applying a greater weighting coefficient to the displacement data ~~the time series data of acceleration~~ in the fourth region than a weighting coefficient applied to ~~the time series data of acceleration~~ the displacement data in the third region, the background components can be obtained with higher accuracy.

Please amend paragraph [0020] as follows.

[0020]

The tire deformation calculating apparatus 10, to which the measurement data of acceleration amplified by the amplifier 4 is supplied, has a data acquiring unit 12, a signal processing unit 14, a deformation calculating unit 16, and a data output unit 18. These units are configured by subroutines and subprograms executable on a computer. In other words, the above individual units are operated by execution of software on a computer that has a CPU ~~20~~ 22 and a memory ~~22~~ 20, thus forming the tire deformation calculating apparatus 10.

Alternatively, instead of using a computer, the tire deformation calculating apparatus of the present invention may be configured as a dedicated apparatus in which functions of individual units are configured by a dedicated circuit.

Please amend paragraph [0028] as follows.

[0028]

More specifically, the region of the tire circumference is divided into a first region including a contact region in contact with a road surface and a second region including other than the first region. The regions that are defined as the first region include a region having a θ of greater than 90 degree and less than 270 degree, a region having a θ of greater than 450 degree and less than 630 degree, and a region having a θ of greater than 810 degree and less than ~~980~~ 990 degree. On the other hand, the regions that are defined as the second region include a region having a θ of equal to or greater than 0 degree and equal to or less than 90 degree and equal to or greater than 270 degree and equal to or less than 360 degree; a region having a θ of equal to or greater than 360 degree and equal to or less than 450 degree and equal to or greater than 630 degree and equal to or less than 720 degree; and a region having a θ of equal to or greater than 720 degree and equal to or less than 810 degree and equal to or greater than ~~980~~ 990 degree and equal to or less than ~~1070~~ 1080 degree. The background component 1 is obtained by calculating a first approximation curve on the data in the first and the second regions by means of least squires method using a plurality of positions (θ, or time corresponding to θ) on the circumference in the second region as the nodes and using a predetermined function groups for example spline functions of third order. The nodes provide constraint conditions on the horizontal axis, that give local curvatures (jog) of the spline functions. In the example shown in Fig. 3B, the positions as indicated by "Δ" in Fig. 3B, that is, the positions of time where θ is 10 degree, 30 degree, 50 degree, 70 degree, 90 degree, 270 degree, 290 degree, 310 degree, 330 degree, 350 degree, 370 degree, 390 degree, 410 degree, 430 degree, 450 degree, 630 degree, 650 degree, 670 degree, 690 degree, 710 degree, 730 degree, 750 degree, 770 degree, 790 degree, 810 degree, 990 degree, 1010 degree, 1030 degree, 1050 degree, and 1070 degree are defined as the node positions.

Please amend paragraph [0030] as follows.

[0030]

Next, the first approximation curve representing the calculated background component 1 is subtracted from the measurement data of acceleration processed in step S102, so that the

acceleration components of the centrifugal force due to tire rotation and the acceleration components of the gravitational force are removed from the measurement data (step S106). Fig. 3D shows the time series data of acceleration after the removal. In this manner, the acceleration components due to contact deformation of the tire tread portion are extracted.

Please amend paragraph [0032] as follows.

[0032]

Noise components contained in the displacement data are calculated as the background component 2 in a similar manner as used for calculating the background component 1 in step S104 (step S110).

Specifically, a region of the tire circumference is divided into a third region including a contact region in contact with a road surface and a fourth region including other than the third region. The regions which are defined as the third region include a region having a θ of greater than 90 degree and less than 270 degree, a region having a θ of greater than 450 degree and less than 630 degree, and a region having a θ of greater than 810 degree and less than ~~980~~ 990 degree. On the other hand, the regions that are defined as the fourth region include a region having a θ of equal to or greater than 0 degree and equal to or less than 90 degree, and equal to or greater than 270 degree and equal to or less than 360 degree; a region having a θ of equal to or greater than 360 degree and equal to or less than 450 degree, and equal to or greater than 630 degree and equal to or less than 720 degree; and a region having a θ of equal to or greater than 720 degree and equal to or less than 810 degree, and equal to or greater than ~~980~~ 990 degree and equal to or less than ~~1070~~ 1080 degree. The background component 2 is obtained by using a plurality of positions (θ, or time corresponding to θ) on the circumference in the fourth region as nodes so as to calculate a second approximation curve on the data in the third and fourth regions through least squares method using a set of predetermined functions. The third region may be the same with or different from the above-described first region. Also, the fourth region may be the same with or different from the above-described second region. As described above, the nodes provide constraint conditions on the horizontal axis, that give local curvatures (jog) of the spline functions. Fig. 4B shows the second approximation curve representing the background

component 2 with a dotted line. In the example shown in Fig. 4B, the positions as indicated by "Δ" in Fig. 4B, that is, the positions of time where θ is 10 degree, 30 degree, 50 degree, 70 degree, 90 degree, 270 degree, 290 degree, 310 degree, 330 degree, 350 degree, 370 degree, 390 degree, 410 degree, 430 degree, 450 degree, 630 degree, 650 degree, 670 degree, 690 degree, 710 degree, 730 degree, 750 degree, 770 degree, 790 degree, 810 degree, 990 degree, 1010 degree, 1030 degree, 1050 degree, and 1070 degree are defined as the node positions.

Please amend paragraph [0033] as follows.

[0033]

By carrying out function approximation on the data shown in Fig. 4A with the third-order spline functions routing through the above described nodes, a second approximation curve as indicated by dotted lines in Fig. 4B is calculated. When carrying out function approximation, there are no nodes in the third regions, and only the plurality of nodes in the fourth regions are used. In least squares method that is carried out in conjunction with the function approximation, the weighting coefficient for the fourth region is set to 1, and the weighting coefficient for the third regions is set to 0.01. The reason why the weighting coefficient for the third regions is smaller than the weighting coefficient for the fourth regions, and no nodes are set in the third regions in calculating the background component 2, is to calculate the background component 2 by using the displacement data mainly in the fourth regions. In the fourth regions, because deformation of the tread portion due to contact is small and such deformation changes smoothly on the circumference, the tire deformation is small on the circumference and such changes are also extremely small. In contrast, in the third regions, the tire tread portion is greatly displaced based on deformation due to contact and changes rapidly. For this reason, the deformation due to contact is great on the circumference and changes rapidly. In other words, the deformation of the tread portion in the fourth region is substantially constant as compared to the ~~third~~ deformation <u>in the third region</u>. Accordingly, by calculating the second approximation curve mainly using the displacement data obtained in the fourth regions through integration of second order, the deformation of the rotating tire can be obtained accurately, not only in the fourth regions, but also in the third regions including the contact region.

Fig. 4B shows the second approximation curve calculated mainly using the displacement data in the fourth regions with dotted lines. In the fourth regions, the second approximation curve substantially coincides with the displacement data (solid lines).